Geology 10 – Exam 2 Pass Sheet

If you can answer all these questions correctly on the exam, you will get a 70% pass. (Questions will appear on the exam in a different order and with different numbers.) There will be additional question on the exam (~25 to 30% of the exam will be better-than-pass questions – see weekly question sheets for content). These can help you to raise your grade from 70 (C) to a B (80-89) or A (90+). Note: YOU MUST BRING THIS COMPLETED SHEET WITH YOU TO TAKE THE EXAM – NO SHEET – NO EXAM. Exam will be closed notes, closed book, – you cannot use this sheet on the exam. Good luck!

Name the basic atomic particles and describe their charges and masses.

Particle	**Charge**	**Mass (in AMU)**
1.		
2.		
3.		

An atom has an atomic number of 19 and an atomic mass of 39. Based on this information, answer the following questions. (Note: numbers are DIFFERENT than on pass sheet).

4. How many protons does it have?		5. How many valence electrons does it have?	
6. How many neutrons does it have?		7. What is its symbol/name?	

Indicate for each of these substances whether or not it is a mineral. If not, indicate why not!

8. Gold		Salt	
9. Glass		Ice	
10. Sugar		Plastic	

11. Fe2+ substitutes for some Si in quartz. What property of quartz changes because of this substitution?	
12. Describe the primary difference between covalent and ionic bonds (be specific!).	
13. What is the best test for distinguishing calcite from anything else. (Describe!)	
14. What's the textural name for rocks that contain no minerals (no crystals)?	
15. What **two** MAJOR factors lead to increased explosivity (hazard) of a volcano? (Be specific.)	
16. What **three** factors lead to <u>increased</u> crystal size in igneous rocks?	
17. What **three** factors lead to <u>increased</u> magma viscosity?	
18. List the three MAIN gases that are released during volcanic eruptions.	

What two methods of lithification turn sediment into rock? For which sediment types?

Lithification process	**Sediment types to which this process applies**
19.	
20.	

21. What's the most common natural acid found in waters and how does it form in nature?

DATE: _____ **NAME:**_____

What are the two most common detrital minerals in sedimentary rocks? Why?

Most common detrital minerals	Reason why each is so common
22.	
23.	

Complete this table:

Produce magmas (melt mantle rock) by:	Geologic environment where this melt method occurs:
24.	
25.	
26.	

27. List 3 locations where fluids come from in a meta-morphic environment.	
28. Explain the difference between fracture and cleavage. (Be specific!)	
29. What is the chemical formula for Quartz?	
30. What is the chemical formula for Calcite?	
31. List three textural changes that occur to metamorphic rocks as grade increases.	
32. Which volcanic hazard travels the furthest from the vent?	
33. Which volcanic hazard travels the fastest and is the least possible to avoid if you happen to be in its path?	
34. Which volcanic hazard travels second furthest from the vent and is the most dangerous to cities and towns?	
35. What is the difference between weathering and erosion?	
36. What is the primary reason that physical weathering increases the rate of chemical weathering?	

Characterize these five main igneous textures: (note: > means "greater than"; < means "less than")

Textures:	(Circle correct answer)	(Circle correct answer)	(Circle correct answer)
37. Phaneritic	Crystals: visible | microscopic | none	Vesicles: > 50% | < 50% | Not possible	Intrusive / Extrusive
38. Aphanitic	Crystals: visible | microscopic | none	Vesicles: > 50% | < 50% | Not possible	Intrusive / Extrusive
39. Frothy	Crystals: visible | microscopic | none	Vesicles: > 50% | < 50% | Not possible	Intrusive / Extrusive
40. Glassy	Crystals: visible | microscopic | none	Vesicles: > 50% | < 50% | Not possible	Intrusive / Extrusive
41. Pyroclastic	Crystals: visible | microscopic | none	Vesicles: > 50% | < 50% | Not possible	Intrusive / Extrusive

Characterize these igneous compositions by their silica content and main mineral components:

Compositions:	**(Circle correct answer)**	**Main mineral components**
42. Ultramafic	Silica content: < 45% | 45 – 55% | 55 – 65% | > 65%	
43. Mafic	Silica content: < 45% | 45 – 55% | 55 – 65% | > 65%	
44. Intermediate	Silica content: < 45% | 45 – 55% | 55 – 65% | > 65%	
45. Felsic	Silica content: < 45% | 45 – 55% | 55 – 65% | > 65%	

What are the three different kinds of chemical weathering and their end products?

Chemical Weathering Processes	**End products**
46.	
47.	
48.	

49. What, specifically, happens to Quartz during chemical weathering?	

Circle the correct P/T/Fluid conditions of these metamorphic environments.

Environment	**Pressure**	**Temperature**	**Chemically active fluids**
50. Contact Metamorphism	High/Low	High/Low	High/Low
51. Subduction Metamorphism	High/Low	High/Low	High/Low
52. Burial metamorphism	High/Low	High/Low	High/Low

53. List three characteristics of a rock or its environment that would ***increase*** the rate of rock weathering (be specific!).		
54. Describe the grain size, shape, sorting, and composition of sediment that has traveled (via running water), far from its source AND not at all.	**FAR**	**NEAR**

Circle the best answer for to correctly describe these volcanic landforms.

55. Which is the tallest?	Cinder Cone / Shield Volcano / Stratovolcano / Volcanic Dome
56. Which is built of pyroclastic and lava layers	Cinder Cone / Shield Volcano / Stratovolcano / Volcanic Dome
57. Which is built of mostly mafic lavas?	Cinder Cone / Shield Volcano / Stratovolcano / Volcanic Dome
58. Which is built of only felsic magma?	Cinder Cone / Shield Volcano / Stratovolcano / Volcanic Dome
59. Which is the smallest?	Cinder Cone / Shield Volcano / Stratovolcano / Volcanic Dome
60. Which exists on the flanks of other volcanoes?	Cinder Cone / Shield Volcano / Stratovolcano / Volcanic Dome

NEXT PAGE: MINERAL AND ROCK MATCHING

Fill in the appropriate letter NEXT to the number. WRITE LEGIBLY. If I can't read an answer, it will be marked wrong.
REMEMBER: These matching questions below will be in a different order on the exam!

		Description to match to correct mineral	Minerals
	61.	3-D framework silicate. H=7; often clear or white; conchoidal fracture. (all colors.)	a. Calcite
	62.	Family of sheet silicates that display 1 direction of platy cleavage.	b. Feldspars
	63.	Fe- + Mg-rich, dark chain silicates with 2 cleavage directions; prismatic form.	c. Fluorite
	64.	Fe- + Mg-rich, green silicate; single silicon-oxygen tetrahedron; conchoidal fracture.	d. Galena
	65.	Light-colored salty mineral found in sedimentary evaporates.	e. Garnet
	66.	Light-colored carbonate that effervesces in hydrochloric acid.	f. Graphite
	67.	Metallic and nonmetallic luster. Dark red-brown streak.	g. Gypsum
	68.	Metallic luster. Brassy yellow color. Cubic form. Often mistaken for gold.	h. Halite
	69.	Metallic luster. High density (8) mineral. Silver, with cubic form & cleavage.	i. Hematite
	70.	Metallic luster. No cleavage. Attracted to a magnet.	j. Magnetite
	71.	Metallic luster. Soft: fingernail scratches. Leaves streak on most objects.	k. Micas
	72.	Multi-colored mineral with four cleavage directions and triangular cross-section.	l. Olivine
	73.	Opaque, (hardness=1), metamorphic silicate; soapy feel.	m. Pyrite
	74.	Red dodecahedron-shaped silicate (H=7) usually in high-grade metamorphics.	n. Pyroxene/ hornblende
	75.	Three-dimensional framework silicate. Twinning or exsolution lamellae. Some pink.	o. Quartz
	76.	Transparent/translucent sulfate (hardness=2; evaporite.	p. Talc

		Description to match to correct rock	Igneous rocks
	77.	Rock made entirely out of glass.	a. Andesite
	78.	Rock made out of ash, crystals, rock fragments, pumice, etc.	b. Basalt
	79.	Felsic composition rock with more than 50% vesicles.	c. Diorite
	80.	Mafic composition rock with more than 50% vesicles.	d. Gabbro
	81.	Phaneritic rock of felsic composition.	e. Granite
	82.	Phaneritic rock of intermediate composition.	f. Obsidian
	83.	Phaneritic rock of mafic composition.	g. Pumice
	84.	Aphanitic rock of felsic composition.	h. Rhyolite
	85.	Aphanitic rock of intermediate composition.	i. Scoria
	86.	Aphanitic rock of mafic composition.	j. Tuff

		Description to match to correct rock	Sedimentary rocks
	87.	Contains poorly sorted, angular detrital fragments: gravel-sized grains.	a. Breccia
	88.	Contains poorly sorted, rounded detrital fragments: gravel-sized grains.	b. Chalk/Diatomite
	89.	Consists primarily of well-sorted, sand-sized grains.	c. Conglomerate
	90.	Consists of compacted clay grains of smallest size; can split in layers.	d. Chert
	91.	Chemical calcium carbonate; natural precipitation or recrystallization of shells.	e. Limestone
	92.	Chemical silica; forms from precipitation or when shells recrystallize.	f. Mudstone or shale
	93.	~100% microscopic silica or calcareous shells. (Clastic, organic, from deep-sea.)	g. Sandstone

		Description to match to correct rock	Metamorphic rocks
	94.	Green, smooth rock: hydrothermal metamorphism of mantle rock in spreading centers.	a. Eclogite
	95.	Nonfoliated rock consisting of grains of calcite.	b. Gneiss
	96.	Nonfoliated rock consisting of quartz.	c. Greenstone
	97.	Nonfoliated, dark rock: contact metamorphism of basalts or mudstones.	d. Hornfels
	98.	Nonfoliated; calcite, quartz, and other mins: contact metamorphism of mixed source.	e. Marble
	99.	Fine-grained, light-green: low-grade burial metamorphism of basalt. Weakly foliated.	f. Phyllite
	100.	Garnets in green groundmass: high grade subduction zone metamorphism of basalt.	g. Quartzite
	101.	Dull fine-grained; foliated; breaks in hard sheets: lo-grade regional meta. of mudstone.	h. Schist
	102.	Satiny; foliated; undulating surfaces: lo- to med-grade regional meta. of mudstone.	i. Serpentinite
	103.	Coarse-grained; foliated; mostly micas: med-grade regional meta. of mudstone/basalt.	j. Skarn
	104.	Coarse; foliated; dark & light bands: hi grade regional meta. mudstone/granite.	k. Slate